

Health & Safety Manual

Supplement 2.23

Nuclear Safety Analysis Reports

Approved by the ES&H Working Group

_____ date _____

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Nuclear Safety Analysis Reports*

Contents

Terms and Definitions.....	ii
1.0 Introduction.....	1
2.0 Applicability.....	1
3.0 Requirements/Regulatory Summary	1
4.0 Process for Compliance.....	2
5.0 Responsibilities	2
6.0 LLNL Contacts	2
7.0 Supporting References and Standards	2

Terms and Definitions

Authorization Basis

The authorization basis establishes the safety envelope for a facility's operation or activity and defines requirements for controlling safety of the operation. It includes hazards and risk analyses, descriptions of administrative and engineering controls for preventing or mitigating hazards, and associated technical and operational limits. The type and content of safety documents that will constitute the authorization basis will vary, depending on the hazard and complexity of the operation or activity. The primary authorization basis documents include a Safety Analysis Report (SAR) and Technical Safety Requirements (TSRs); a Basis for Interim Operation (BIO) or Justification for Continued Operations (JCO), or the DOE-prepared Safety Evaluation Report (SER). Positive Unreviewed Safety Questions (USQ), which include operations that have been subsequently approved by DOE, are also part of the authorization basis. The authorization basis may also include environmental impact reports or statements and NEPA reports.

Subsequent to establishing the safety envelope, the contractor prepares for operation by implementing the controls (e.g., testing, procedures, and training) described in the authorization basis.

Final Safety Analysis Report (FSAR).

The FSAR addresses how the findings of the PSAR were implemented into the final design. It completes documentation of the analysis begun as a PSAR.

Preliminary Safety Analysis Report (PSAR).

A PSAR is prepared during the design phase of a project to determine whether safety features have been sufficiently considered to ensure the project operates safely.

Safety Analysis

A documented process to (1) systematically identify hazards within a given operation; (2) describe and analyze the adequacy of measures taken to eliminate, control, or mitigate identified hazards; and (3) analyze and evaluate potential accidents and their associated risks. The Safety Analysis uses a graded approach commensurate with the associated hazards and risks involved with the activity, operation, or facility.

Safety Analysis Report (SAR)

A report that documents the adequacy of a safety analysis for a nuclear facility to ensure it can be constructed, operated, maintained, shut down, and decommissioned safely and is in compliance with applicable laws and regulations.

Safety Basis

The combination of information relating to the control of hazards at a facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely.

Nuclear Safety Analysis Reports

1.0 Introduction

DOE Order 5480.23 (Nuclear Safety Analysis Reports) contains detailed requirements for performing safety analyses that establish and evaluate the adequacy of the safety basis for nuclear facilities. Detailed LLNL implementing guidance on this subject has not been written. Therefore, refer to DOE Order 5480.23, DOE-STD-3009-94 (Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports), and DOE-STD-1027-92 (Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23) for guidance on nuclear facility hazard categorization and report preparation. The safety analysis report (SAR) provides part of the authorization basis for a nuclear facility to proceed with operations.

The process for promulgating new DOE rules, orders, and standards for nuclear facilities as well as the terms and conditions in the contract between the DOE and the University of California are in a state of flux. This supplement will be updated as the requirement source documents change.

2.0 Applicability

DOE Order 5480.23 and its associated DOE standards apply to all LLNL nuclear facility operations. Each LLNL nuclear facility with a DOE-approved SAR shall maintain the accuracy of the SAR through the unreviewed safety questions process described in Supplement 2.21 of the *Health & Safety Manual*.

3.0 Requirements/Regulatory Summary

DOE Order 5480.23 and associated DOE standards contain the minimum requirements for performing the safety analyses mentioned above and preparing the SARs, which document the results. Attachment 1 to the Order (Interim Guidance for DOE Order 5480.23) and DOE-STD-3009-94 contain guidance on the format and content to be used when preparing SARs. DOE-STD-1027-92 contains guidance on initial categorization of nuclear facilities.

Subsection 1.1, Section 2 (omit subsections 2.1.1, 2.2, 2.5.1, 2.5.3, and 2.5.4), Section 3 (omit subsections 3.2, and 3.7–3.9), and Appendix C of Supplement 6.06 of the *Health & Safety Manual* were not written to fulfill the requirements of DOE Order 5480.23, but may be helpful in preparing an LLNL nuclear facility SAR.

4.0 Compliance

Applicable facilities shall comply with DOE Order 5480.23.

5.0 Responsibilities

Facility Associate Directors (ADs) are responsible for implementing the requirements in DOE Order 5480.23.

A draft SAR document shall be prepared for all facilities covered by this DOE Order. It shall be submitted to the Hazards Control Department Head for review prior to approval by the Facility AD. The LLNL-approved SAR will then be forwarded to the DOE OAK Program Manager for approval. DOE's approval of the SAR shall be obtained prior to operation of a new facility.

Annual updates to SARs will be reviewed by the Hazards Control Department Head and approved by the Facility AD.

6.0 LLNL Contacts

For additional information, contact the following as necessary:

- Directorate Assurance Manager.
- ES&H Team Leader.

7.0 Supporting References and Standards

DOE Order 5480.23, "Nuclear Safety Analysis Reports"; and Attachment 1, "Interim Guidance for DOE Order 5480.23."

DOE-STD-3009-94, "Preparation Guide For U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports."

DOE-STD-1027-92, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23."

Health & Safety Manual, Supplement 6.06, "Safety Analysis Guide"; Supplement 2.21, "Unreviewed Safety Questions"; and Supplement 2.22, "Technical Safety Requirements," M010, Lawrence Livermore National Laboratory, Livermore, CA.